Resonance

Draw the possible resonance structures for following molecules or ions. Through formal charges on atoms, determine which is the most likely structure.

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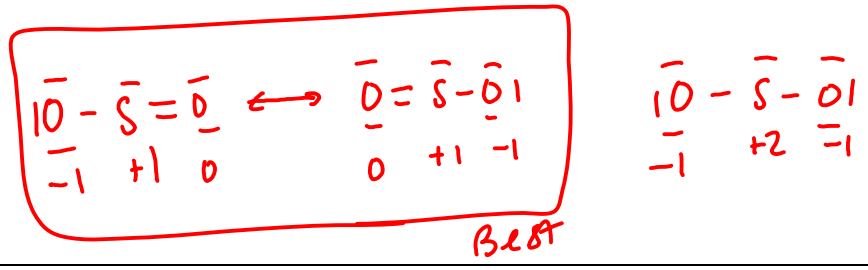
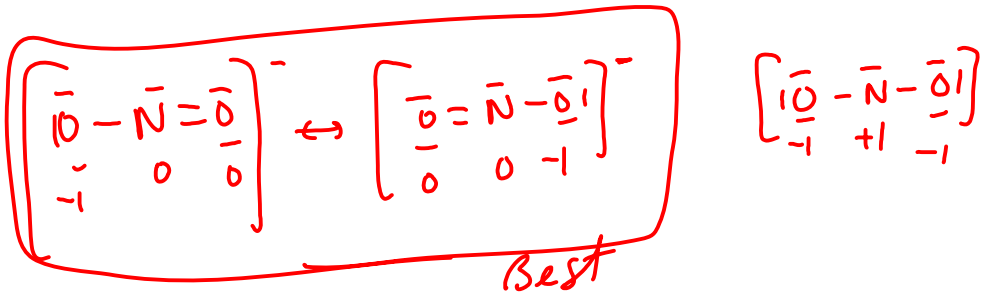
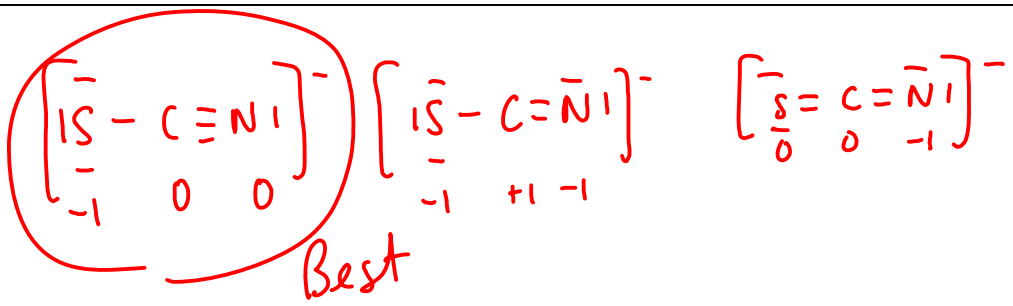
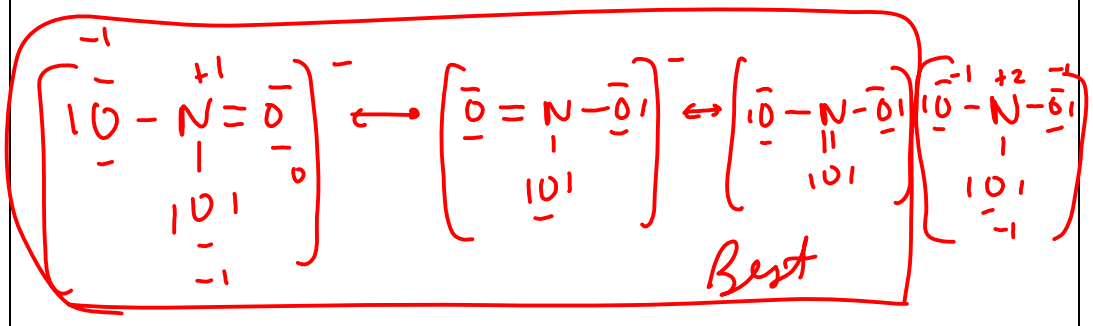
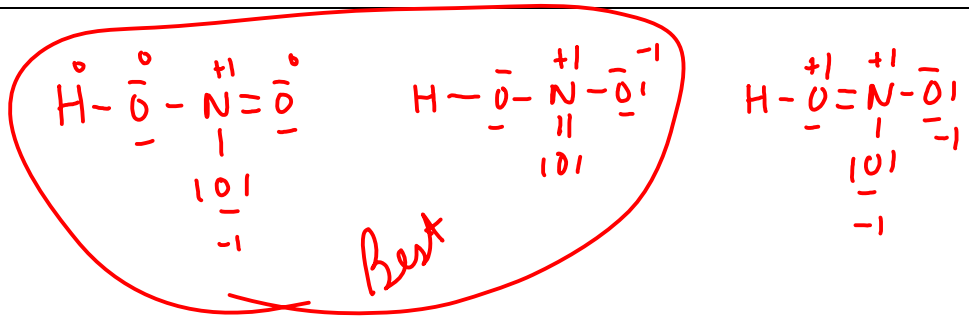
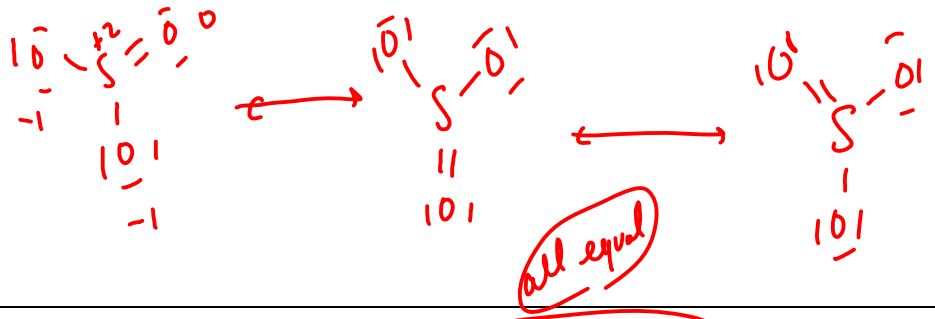
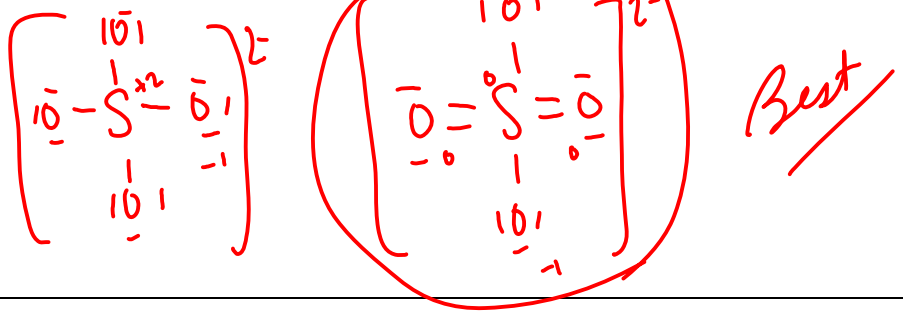
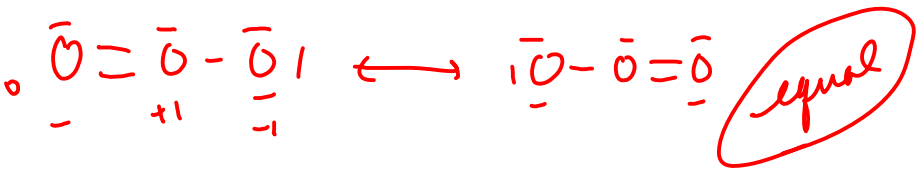
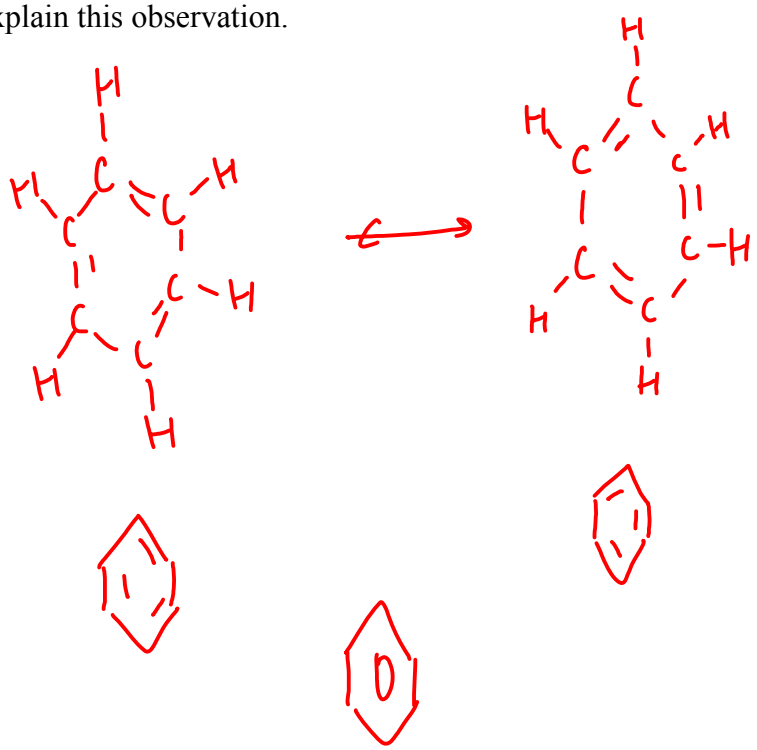
|---|---|
| $SO_2$ |  |
| $NO_2^-$ |  |
| $SCN^-$ |  |
| $NO_3^-$ |  |
| $HNO_3$ |  |

| | |
|---|---|
| $SO_3$ |   |
| $SO_4^{2+}$ |   |
| $O_3$ |   |

Use the concept of resonance to explain why all six C—C bonds in benzene, $C_6H_6$, are equal in length. Benzene's structure has all six carbons arranged in a ring structure. These C—C bonds are shorter than C—C single bonds, but longer than C=C double bonds. Use resonance to explain this observation.



all bonds have partial single & double bond character. So, they shorter the bonds (compared to single bonds), but still leaves the bonds longer than a regular C=C double bond.